

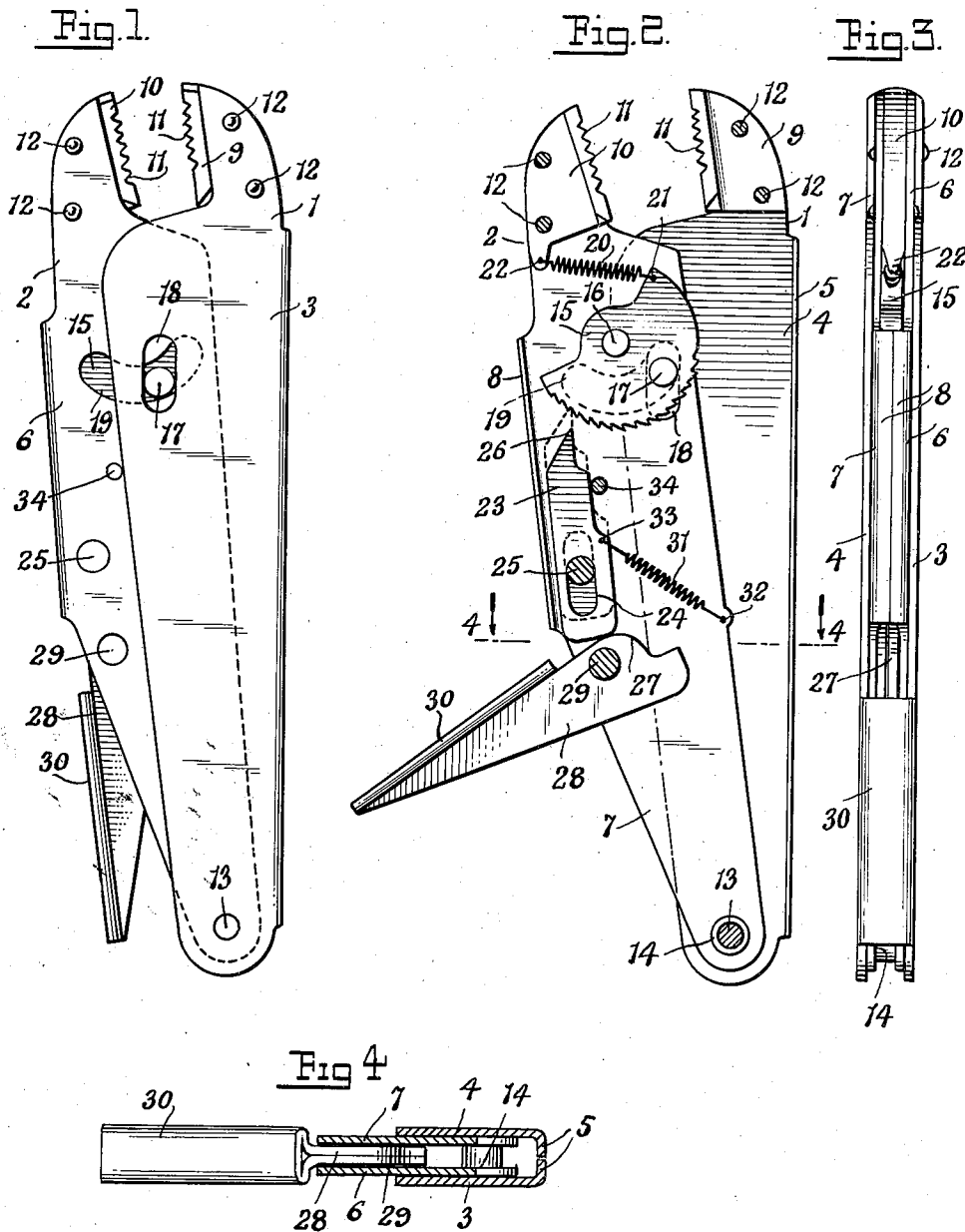
July 12, 1949.

V. S. WARD ET AL

2,475,866

CAM LEVER ACTUATED PIVOTED JAW WRENCH

Filed Aug. 2, 1946



INVENTORS.
Vincent S. Ward & Gordon K. Harbut
 BY
Harry Rozinsky
 Attorney.

UNITED STATES PATENT OFFICE

2,475,866

CAM LEVER ACTUATED PIVOTED JAW
WRENCH

Vincent S. Ward and Gordon K. Hurlbut, Binghamton, N. Y., assignors to B. M. C. Manufacturing Corporation, Binghamton, N. Y., a corporation of New York

Application August 2, 1946, Serial No. 688,074

4 Claims. (Cl. 81-78)

1

This invention relates to tools, and more particularly to wrenches so constructed as to permit easy manipulation and use.

Most wrenches in use at the present time are provided with adjusting means, generally consisting of a threaded element, which must be rotated to adjust the jaws of the wrench to cause them to fit various sizes of nuts or other objects intended to be gripped between the jaws. One of the objects of the present invention is to provide a wrench in which threaded or other similar jaw-adjusting means is dispensed with, and the jaws are adjusted to accommodate them to nuts or other objects of different sizes by merely squeezing the jaws toward one another to fit the selected nut and then, by the fingers of the hand which is gripping the tool, moving a locking lever to hold the jaws in the position of adjustment so obtained.

Another object of the invention is to provide a wrench, operative as above described, which is of simple construction, which has relatively few parts, and which will withstand the use and abuse to which a tool of this character is generally subjected.

Still another object of the invention is to provide a tool of this character intended for one-handed adjustment and operation, enabling the tool to be fitted around a nut or the like; gripped to cause the tool to adapt itself to the particular nut engaged, then used to tighten or loosen the nut, and then freed from the nut, all of these actions being performed by the hand of the operator in which the wrench is being held.

These and other objects are attained by the invention, a more particular description of which will hereinafter appear and be set forth in the claims appended hereto.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed, Fig. 1 is a side elevation of a wrench constructed in accordance with the invention, the jaws of the tool being shown in a partly open position. Fig. 2 is a side view of the wrench, with one plate of each of the jaw frames being removed to disclose interior parts, and parts being shown in section; Fig. 3 is an edge view of the wrench, looking from the left of Fig. 1, and Fig. 4 is a sectional view on the line 4-4 of Fig. 2, looking in the direction of the arrows.

With reference to the drawing, 1 generally indicates the outer frame member or fixed frame of the wrench, the same, in the form shown, consisting of a pair of sheet-metal face plates 3 and 4, each of which is provided with a laterally-bent

2

flange 5, extending for a portion of its rear, said flanges 5 coming together at the rear of the tool, as shown in Fig. 4, thereby forming the outer or fixed frame member 1 into channel shape, also as clearly seen in Fig. 4.

The inner or movable frame 2 of the tool is somewhat similar in shape and construction to the outer frame member 1, in that it is composed of two sheet-metal face plates 6 and 7 flanged as shown at 8, and with said flanges 8 coming together at the forward edge of the frame member 2, as clearly seen in Fig. 3. The arrangement is such that the frame member 2 fits, and is slidable within, the outer frame member 1. The lower end of the inner frame member 2 is pivoted between the walls or face plates 3 and 4 of the frame member 1 by means of a shouldered pin 13, said pin having the shoulders 14 to hold the sides of the inner frame member in properly spaced relation. By means of this construction, the two frames 1 and 2 are movable toward one another to thereby bring the jaws provided on them into operative gripping position in a manner to be described.

The jaw on the outer frame member 1 is composed of a solid insert 9 located between and constituting a spacer for the face plates 3 and 4, said jaw being provided with the serrated gripping face 11. Rivets 12, or other equivalent fastening elements, hold the jaw insert 9 in place. The inner frame 2 is also provided with a jaw portion 10, similar to that shown at 9, and also provided with the gripping face 11.

Rotatively mounted on a pin 16 between the face plates 6 and 7 of the inner frame member 2, is a segmentally-shaped ratchet wheel 15, said ratchet being provided with the stud portions 17 extending from its opposite faces, these studs being movable in arcuate slots 19 formed in the face plates 6 and 7. The studs 17 are also located in vertically-disposed slots 18 formed in the face plates 3 and 4 of the outer frame member, the latter slots extending transversely of the arcuate slots 19, as noted in Fig. 1.

A coil spring 20 has one end attached to a lug 22 on the jaw insert 10, and has its other end fastened to a portion of the ratchet 15, as indicated at 21. The pin-and-slot arrangement heretofore described, and consisting of the studs 17 disposed in the arcuate slots 19 and straight slots 18, is such that when the two jaw-frames 1 and 2 are moved toward one another or swung away from one another, the segmental ratchet 15 will be rotated. The open position of the jaws of the wrench is substantially that shown in Fig. 2,

3

the jaws being normally maintained in that position by means of the spring 20, at such times when the locking means for the ratchet, consisting of a sliding pawl 23 and a locking lever 28 are in released position.

The pawl 23 is provided with a slot 42 fitting around a pin 25 secured between the walls or face plates 6 and 7 of the inner frame member 2. Sliding movement of the pawl 23 toward the toothed edge of the ratchet 15 is secured by means of the pivoted lever 28, which is pivotally mounted on a pin 29 between the plates 6 and 7 of the inner frame member 2. In the form shown, the lever 28 is made from a single folded sheet-metal blank, doubled upon itself to provide a relatively wide and flat finger-piece 30, said lever being shaped adjacent one end to provide a cam surface 27 against which the lower end of the sliding pawl 23 is maintained. A coil spring 31 has one end attached at 32 to the face plate 7, and its other end is attached as at 33 to the pawl 23. Said spring tends to hold the end of the pawl 23 against the cam surface 27. A guide pin 34 directs the pawl 23 in its vertical sliding movement and prevents it from being pulled sidewise under the pull of the spring 31.

From the foregoing, the operation of the improved wrench will be readily understood. The tool is shown in its open position in Fig. 2, wherein it will be noted that the locking lever 23 has been swung outwardly to such an extent as to enable the pawl 23 to be drawn downwardly by the spring 31 to have its end 26 located away from and disengaged from the ratchet 15. This is the free position of the wrench and while the parts are in this position, the tool is in readiness to be applied to a nut or other object to be gripped between the jaws.

To apply the wrench to the nut or other object, the jaws are fitted about the object and the tool is squeezed, this causing the two jaws to move toward one another to an extent required to enable them to grip the object between them. Since the ratchet 15 is disengaged from pawl 23 at this time, the jaws readily swing toward one another to engage the object between them. As soon as the object is gripped, the fingers of the hand that is holding the wrench, can be used to swing the locking lever 28 down to its closed or locked position, as in Fig. 1. This causes the cam surface 27 on lever 28 to elevate the pawl 23 and bring its end 26 into engagement with the toothed edge of the ratchet 15. This locks the ratchet against movement in a counter-clockwise direction, when viewed as in Figs. 1 and 2, and since the studs 17 cannot then ascend in the vertical slots 18 in the outer frame member 1, the two frames 1 and 2 are thus locked against separating movement, and the object will be firmly gripped between the two jaws 9 and 10. To release the object between the jaws, the locking lever 28 in swung to open position, as shown in Fig. 2. This allows pawl 23 to descend under the pull of spring 31, thus disengaging the pawl from the ratchet 15. When the ratchet is thus freed, it will be drawn counter-clockwise by the pull of the spring 20, and the studs 17, operative in the slots 18 and 19, will swing the jaw frames to open position as in Fig. 2.

It will be observed that since the ratchet may be rotated in a clockwise direction while it is engaged by the pawl 23, the wrench may be used in another manner. That is to say, the locking lever 28 may be swung down to closed position while the wrench has its jaws open, and with the

4

locking lever down, the placement of the wrench about an article to be gripped is merely a matter of squeezing the wrench in the hand to close the jaws on the nut and the jaws will remain in engaged position until released by the outward swing of the locking lever 28.

From the foregoing, it will be clear that the wrench described is capable of one-handed operation since it can be placed about a nut or other object and caused to grasp the same by merely squeezing the wrench in the hand. The release of the wrench can be readily secured by merely swinging the locking lever to open position, and speed and ease of operation of the tool is greatly facilitated.

While we have shown and described one embodiment of the invention, it is obvious that the same is not to be restricted thereto, since various modifications may be readily made without departing from the spirit of the invention. For example, in the embodiment shown, the pawl 23 is shown as being provided with a pointed extremity engaging but one tooth. To resist strain and wear on the ratchet teeth it may be found desirable to so shape the end of the pawl to enable it to engage with several teeth on the ratchet. This and other changes are deemed as being within the scope of the invention.

What we claim is:

1. In a wrench of the character described, an outer jaw frame of substantially channel shape and including a pair of side walls, an inner frame also of channel shape and having side walls, the inner frame fitting within the outer frame and pivoted at one end of the same, the ends of the frames remote from the pivot being provided with jaw portions, a ratchet wheel rotatively mounted within the inner frame and between the walls of the same, said ratchet wheel having laterally-extending stud portions, the walls of the inner frame being provided with arcuate slots in which said studs ride, the walls of the outer frame being each provided with a slot extending transversely of the arcuate slots, the studs riding in the slots in the walls of the outer frame, a pawl carried by the inner frame, means tending to hold said pawl disengaged from the ratchet wheel, and manually-operated means for urging the pawl into engagement with the ratchet.

2. A wrench as provided for in claim 1, wherein the pawl is slidably mounted between the walls of the inner frame, the means for holding the pawl disengaged from the ratchet consisting of a spring for urging the pawl away from the ratchet, and means for urging the pawl into engagement with the ratchet consisting of a pivoted lever mounted on the inner frame and having a cam surface operative against the pawl.

3. In a wrench of the character described, a pair of channelled frames, one of which is fitted inside of the other, the inner frame being pivoted adjacent to one of its ends to the outer frame, the frames each having a jaw portion at one of its ends, a ratchet wheel rotatively mounted between the walls of the inner frame, a sliding, slotted pawl carried by the inner frame and slidable to and from the ratchet, a spring attached to the pawl and tending to draw the same from engagement with the ratchet, a locking lever pivoted on the inner frame and having a cam surface operative against the pawl to move the pawl into engagement with the ratchet wheel, the ratchet wheel being provided with laterally-extending stud portions, the walls of the inner frame being provided with arcuate slots in which

5

said studs are located, the walls of the outer frame being provided with slots in which said studs are located, the latter slots extending transversely of the arcuate slots, and spring means connected to the ratchet wheel and tending to cause the same to hold the jaws apart when the locking lever is in inoperative position.

4. In a wrench of the character described, a pair of pivotally connected jaw frames, the pivot for said frames being located adjacent to one end of said frames, a ratchet wheel rotatively carried by one of the frames, a pawl carried by and slidably mounted in the same frame, a spring tending to hold the pawl away from the ratchet wheel, said spring having one end attached to the pawl and its other end attached to the frame on which the pawl is carried, a cam lever for urging the pawl into engagement with the ratchet wheel in opposition to the pull of the spring, said cam lever being pivotally mounted on the frame on which the pawl is located, one of the frames having arcuate slots, the other frame having slots extending transversely of the arcuate slots, the ratchet wheel carrying a pin extending through

6

all of the slots whereby the jaw members can be moved either toward or away from one another when the pawl is disengaged from the ratchet wheel and can be moved only toward one another when the pawl is held in engagement with the ratchet wheel by the cam lever.

VINCENT S. WARD.
GORDON K. HURLBUT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
15 156,370	Moore -----	Oct. 27, 1874
348,522	Huffman -----	Aug. 31, 1886
838,514	Baker -----	Dec. 18, 1906
1,071,687	Becklin -----	Sept. 2, 1913
20 1,434,911	Mutchmor -----	Nov. 7, 1922
1,711,718	Bierly -----	May 7, 1929
2,112,873	Wright -----	Apr. 5, 1938
2,249,661	Littlefield -----	July 15, 1941